PTO/SB/97 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Certificate of Transmission under 37 CFR 1.8

USPTO Fax No.: (571) 273-8300

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office

on August 22, 2005
Date

M. Kay Lilly
Signature

M. Kay Lilly
Typed or printed name of person signing Certificate

Registration Number, if applicable

Telephone Number

Note: Each paper must have its own certificate of transmission, or this certificate must identify each submitted paper.

10/658,084
TP2686USNA

APPEAL BRIEF UNDER 37 C.F.R. §41.37
DECLARATION UNDER 37 CFR 1.132 of RAYMOND REISDORF
CERTIFICATE OF TRANSMISSION

Rev. 10/93

RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 1733
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF:

RAYMOND JOSEPH REISDORF ET. AL.

CASE NO.: **TP2686USNA** APPLICATION NO.: **10/658,084**

CONFIRMATION NO.: **1439** GROUP ART UNIT: **1733**

EXAMINER: **SAMCHUAN CUA YAO** FILED: **SEPTEMBER 9, 2003**

FOR: **PROCESS FOR PRODUCING CARPET**

APPEAL BRIEF UNDER 37 C.F.R. §41.37

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Responsive to the Final Rejection mailed 21 December 2004 as to the above-referenced application, a Notice of Appeal having been filed 21 June 2005, Appellants submit the following Appeal Brief.

1. REAL PARTY IN INTEREST

The present application is assigned to E. I. du Pont de Nemours and Company, 1007 Market Street, Wilmington, Delaware 19898, said assignment being recorded at reel 014189, frame 0506.

2. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences.

3. STATUS OF CLAIMS

Claims 1-5, 8-15 and 18 stand finally rejected in the present application.

Claims 6, 7 and 17 stand withdrawn as being directed to non-elected species.

4. STATUS OF AMENDMENTS

All amendments to the claims have been entered. It is unclear whether the amendment to the specification submitted in Appellants' response of 21 April 2005 has been entered, as the Examiner has not indicated its status on the Advisory Action of 12 May 2005, but non-entry should not affect the outcome of this appeal.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

In one embodiment, the present invention is directed to a process for preparation of a tufted polyamide-type fiber carpet comprising providing a primary backing tufted with yarn comprised of at least 85% by weight of fibers selected from the group consisting of nylon fibers, wool fibers, and blends thereof, said tufted primary backing having a carpet side and an opposite back side; providing a molten polymer adhesive having a melt index of at least 150 according to ASTM D-1238 @190°C with a weight of 2.16 Kg on the back side of the tufted primary backing, said polymer adhesive comprising at least 85% by weight of one or more ethylene copolymers or terpolymers each comprised of 50 to 95 weight % of ethylene, and 5-50 weight % of at least one carboxylic acid comonomer; compressing said tufted primary backing and said molten polymer adhesive layer under a moving belt that applies a pressure of at least 1 N/cm^2 for a period of at least 5 seconds during which time the polymer adhesive remains in a molten state; and cooling said molten polymer adhesive to a temperature below the melting point of said molten adhesive.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-5, 8-15 and 18 stand rejected under 35 U.S.C. §103(a) as obvious over WO 95/14806, in view of either Scott et al. (U.S. Patent No. 4,798,644), Reith (U.S. Patent No. 4,939,036) and optionally in view of Cross (U.S. Patent No. 4,731,143) and further in view of Fink (U.S. Patent No. 5,288,349).

2. Claim 16 stands rejected under 35 U.S.C. §103(a) as obvious over WO 95/14806, in view of either Scott et al., Reith, and optionally in view of Cross and further in view of Fink and Kasamatsu (U.S. Patent No. 4,708,629).

7. ARGUMENT

1. Claims 1-5, 8-15 and 18 stand rejected under 35 U.S.C. §103(a) as obvious over WO 95/14806 (WO '806), in view of either Scott et al (U.S. Patent No. 4,798,644), Reith (U.S. Patent No. 4,939,036) and optionally in view of Cross (U.S. Patent No. 4,731,143) and further in view of Fink (U.S. Patent No. 5,288,349). Appellants traverse this basis for rejection and respectfully request reconsideration and withdrawal thereof.

Appellants reiterate their comments in traverse of the application of the WO '806, Scott et al., Reith and Cross references, as set forth in their previous response, filed November 16, 2004. The Board is earnestly solicited to review Appellants' comments therein.

Discussion of the Present Invention

One important aspect of the presently claimed invention is the use of a polymer adhesive which has a relatively low viscosity (high melt index). An object of the present invention is to improve currently existing tufted carpets, which have a tendency to lose carpet fibers due to abrasive wear, such as heavy foot traffic, rolling of chair casters and movement of furniture and equipment over the surface. At the time of the present invention, existing tufted carpets would lose many individual carper fibers from the carpet tufts, in spite of the fact that the entire tufts were not pulled from the backing (specification, page 2, line 33, bridging to page 3, line 15). The Lisson Tretrad test has been developed to measure and evaluate the tendency of a carpet to lose individual fibers (page 3, lines 16-33).

> According to the present invention, the polymer adhesive
>
> is applied in a manner that allows the adhesive to impregnate the fiber networks of the tufts and contact the overwhelming majority of the fibers in the tufts (page 10, lines 5-7).

In order to achieve the goal of having the polymer adhesive intimately contact the individual fibers in the tufts,

> [i]t has been found that lower viscosity adhesives can be more readily pressed into the void spaces between the fibers in the yarn tufts. Preferred adhesives have a melt index greater than 150, according to ASTM D-1238 @ 190 C with a weight of 2.16 Kg...(page 18, lines 7-11).

Distinctions over WO '806

WO '806 discloses the use of thermoplastic resin adhesives that have a "relatively high melt viscosity" (page 7, lines 7-9), but a range of melt indices from 2-500 dg/min (page 7, lines 11-15). In contrast, the molten polymer adhesives of the present invention are claimed to have melt indices at least 150. While this apparent overlap in melt index ranges would appear to establish a *prima facie* case of obviousness as to the present claims, the Board's attention is directed to In re Peterson, 315 F.3d 1325; 65 USPQ 2d 1379, wherein the court states:

> We therefore conclude that a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness. That is not to say that the claimed composition having a narrower range is unpatentable. Rather, the existence of overlapping or encompassing ranges shifts the burden to the Appellant to show that his invention would not have been obvious...(Peterson at 1330; emphasis added)...

but that

> ...an Appellant may rebut a prima facie case of obviousness by showing that the prior art teaches away from the claimed invention in any material respect. (Peterson at 1331; emphasis added).

> In WO '806, the patentees' state:

> As a result of this high melt viscosity, the molten resin does not flow as rapidly into the secondary backing web as conventional hot melt adhesives, and more resin is available to penetrate and encapsulate the tufts in the primary backing (page 7, lines 15-20; emphasis added).

Thus, it is clear that the invention of WO '806 is dependent upon the viscosity of the molten resin being low enough to avoid flowing into the secondary backing web. As such, it seems clear that WO '806 teaches away from the use of low viscosity resin adhesives, such as those claimed herein.

In contrast, Appellants disclose that using an adhesive having a melt index greater than 150 requires special handling to avoid having the adhesive run.

> However, when a low viscosity polymer adhesive with a melt index greater than 150 is used, it is difficult to apply a uniform layer of the adhesive to the backside of the primary backing because such low viscosity polymers tend to run rather than forming uniform films. It has been found that such low viscosity polymer adhesive can still be uniformly applied to the backside of the primary backing if the distance that the molten adhesive travels from the extrusion die before contacting the primary backing is kept at less than 5 cm, and more preferably at less than 1 cm. (Specification, page 18, lines 17-25, emphasis added)

It is therefore highly unlikely that such a low viscosity adhesive, i.e. one having a melt index of at least 150, would be suitable for the WO '806 invention, since such an adhesive would not only penetrate into the secondary backing layer, but would even have difficulty staying in place on the primary backing. Further, it is clear from the exemplary data of WO '806 that such low viscosity adhesives were not even investigated, so the problem could not have been discovered by patentees.

Accordingly, Appellants submit that WO '806 teaches away from the use of low viscosity adhesives within the scope of the present claims, in spite of the very broad range of melt indices suggested by the reference. Withdrawal of the rejection is requested on this basis alone.

Alternatively, Appellants submit that the skilled artisan would have no expectation of success in selecting low viscosity adhesives from among those disclosed in WO '806 for use in their invention.

> To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the Appellant's disclosure. MPEP § 2142, citing In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); (emphasis added).

WO '806 discloses a very broad range of possible melt indices for its thermoplastic resin adhesives, from 2-500 dg/min, it is unclear at what melt index their resin adhesives begin to fail the requirement quoted above. The patentees disclose a preferred range below 200 dg/min, and a most preferred range of from 2-50 dg/min (page 7, lines 13-15); and all of their exemplary data falls within this most preferred range: Example 1 = 10 g/10 min; Examples 2-4 = 35 g/10 min. However, the patentees of WO '806 provide no evidence that thermoplastic resin adhesives having the much lower viscosities, such as those having melt indices of at least 150, would not flow into the secondary backing web.

In fact, in view of Appellants' disclosure regarding the special handling necessary when using the molten polymer adhesives of the present invention, which are quite similar in composition but much lower in viscosity than the examples of WO '806, it seems clear that a skilled artisan would not expect the molten polymer adhesives according to the present invention to function in the manner required by WO '806.

Withdrawal of the rejection is requested on this basis, i.e. there would be no reasonable expectation of success in selecting polymer adhesives having melt indices of at least 150 for use in the WO '806 process, as claimed herein.

Further, Appellants respectfully submit that hundreds of possible thermoplastic resin adhesives are represented by the WO '806 melt index range, which essentially constitute a genus, overlapping with which the presently claimed adhesives represent a subgenus (claims 1 and 15).

> The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a prima facie case of obviousness. In re Baird, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious.") In re Jones, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992) (Federal Circuit has "decline[d] to extract from Merck [& Co. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)] the rule that...regardless of how broad, a disclosure of a chemical genus renders obvious any species that happens to fall within it."). MPEP 2144.08 (p. 2100-137).

The Board's attention is further directed to the Court's statement in In re Baird, to wit:

> A disclosure of millions of compounds does not render obvious a claim to three compounds, particularly when that disclosure indicates a preference leading away from the claimed compounds. (Baird at 1552; emphasis added).

As discussed above, the selection of the WO '806 polymer adhesive is specifically directed to avoiding flow of the molten resin into the secondary backing.

> As a result of this high melt viscosity, the molten resin does not flow as rapidly into the secondary backing web as conventional hot melt adhesives, and more resin is available to penetrate and encapsulate the tufts in the primary backing (WO '806 at page 7, lines 15-20; emphasis added).

Accordingly, Appellants respectfully submit that the requirement to select from literally hundreds of possible polymer adhesives within the scope of the WO '806 disclosure, in combination with the WO '806 teaching of a clear preference for high melt viscosity adhesives, as evidenced by the most preferred range of melt indices from 2-50 g/10 min, which do not rapidly flow into the secondary backing, would lead the skilled artisan away from the use of low melt viscosity molten polymer adhesives within the scope of the present claims, and as such, the present claims would not have been obvious in view of the WO '806 disclosure.

Withdrawal of the rejection is requested on this basis.

Likewise, as set forth in the Reisdorf Declaration (9. Evidence Appendix), it can be seen that the closest prior art examples, i.e. tufted carpets made using the high viscosity polymer adhesives of the WO '806 examples, do not achieve a stated goal of the present application, i.e. "to impregnate the fiber networks of the tufts and contact the overwhelming majority of the fibers in the tufts" (page 10, lines 5-7). Withdrawal of the rejection is requested on this basis.

Secondary References

In the first Office Action, issued May 18, 2004, the Examiner applied the Scott et al., Reith and Cross references to address the failure of WO '806 to disclose the use of a drum laminator comprising a moving belt to compress a tufted primary backing and an ethylene adhesive, as well as a number of other deficiencies of that

primary reference with respect to the dependent claims herein (page 4, last paragraph, bridging to page 5).

Scott et al. disclose a method of making a carpet which uses a foamed latex polymer backing (col. 2, lines 42-63), which is typical of the prior art materials which are sought to be replaced by the application of the presently claimed process (specification, page 1, lines 23-34). Scott et al. fail to disclose or suggest the use of low viscosity, high melt index polymer adhesives, as claimed herein.

Reith discloses a method for preparing tufted pile carpet and adhesives therefore (title), using an improved adhesive which comprises only about 30-40 wt% of an ethylene-vinyl acetate copolymer having a melt index of about 100 to about 400 g/10 min. (col. 7, lines 26-31). In contrast, the present invention requires at least 85 wt% of such a low viscosity polymer adhesive, and that the adhesive be a copolymer or terpolymer of ethylene and a carboxylic acid (claim 1). Reith fails to provide any basis for using higher concentrations of low viscosity polymer adhesives according to the present claims in his adhesive formulations. In fact, Reith discloses the addition of various viscosity-reducing additives, such that his adhesive composition can be "formed into a self-supporting sheet or film" (col. 7, lines 41-45). According to the present application, the molten, low viscosity polymer adhesives must receive special handling to ensure uniform coverage of the tufted primary backing (page 18, lines 17-25; claim 16).

Cross discloses a process of transferring a latex film onto a substrate (title), which process can be used to manufacture protective backing coatings for foam-backed carpet (col. 1, lines 10-15). Accordingly, the latex materials disclosed by Cross are not suggested for use in binding tufts to a primary carpet backing. Cross is essentially irrelevant to the present claims.

In the Final Office Action, the Examiner revised his application of the Reith reference in an effort to provide some purported motivation to select lower viscosity polymer adhesives from those disclosed by WO '806:

> b) Reith teaches using 1st and 2nd hot melting adhesive layers for bonding a primary backing to a secondary backing, wherein the 1st hot melting adhesive layer having a viscosity at an activation temperature that "*is sufficiently low that the activated adhesive flows during the finishing step into and around the tuft stitches and the primary backing so that on solidification of the adhesive the tufts are securely bonded in*

> *the carpet structure and resist pull-out*" (col. 4, line 61 to col. 5, line 29; col. 6, lines 12-37; emphasis by the Examiner).

In fact, Reith discloses that his adhesive composition is applied "in sheet form" (col. 4, lines 61-64), which is "inserted between the tufted primary backing and secondary backing" (col. 6, lines 8-17). In contrast, according to the present application, the molten, low viscosity polymer adhesives are extruded onto the primary backing and must receive special handling to ensure uniform coating of the tufted primary backing (page 18, lines 17-25; claim 16), and are clearly not in the form of a self-supporting sheet (Reith, col. 7, lines 41-45) which is inserted between a primary and secondary backing.

Appellants respectfully submit that Reith provides no motivation to select lower melt viscosity polymer adhesives from among those ethylene copolymers disclosed by WO '806 and claimed in the present application. In fact, Reith expresses a preference for use of adhesives that are

> ...about 30 to about 35 weight percent, low density polyethylene having a melt index of about 15 to about 30 grams per ten minutes..." (col. 6, lines 59-65; emphasis added).

Notably, the preferred melt index disclosed by Reith is within the preferred range of WO '806 (2-50 dg/min). Likewise, Reith merely discloses that his adhesives act to resist pull-out of carpet tufts (col. 6, lines 22-27), and is entirely silent about reducing pull-out of individual fibers. As such, it cannot be said that Reith provides motivation to select lower melt viscosity polymer adhesives from among those described in WO '806 to achieve the goals of the present invention.

Fink discloses a carpet and process for manufacturing the same. Specifically, Fink discloses extruding a sheet of isotactic polyolefin polymer onto the primary backing of a carpet (col. 4, lines 34-40). Fink provides no guidance as to the preferred melt index of the isotactic polyolefin. Notably, Fink discloses that polyethylene copolymers having acrylic acid and methacrylic acid comonomers have poor bond strength when used at 100% as hot melt adhesives for polypropylene primary backings (col. 10, lines 34-38; Table A), which in essence teaches away from the presently claimed invention.

At page 6 of the Final Office Action, the Examiner quotes a passage from the "Background" section of Fink, which states:

> [h]ot melt adhesives also must have low enough viscosities at temperatures employed in finishing to achieve good wetting of the backings and sufficient encapsulation of tuft stitches to make the tuft yarns resistant to pull-out, pilling and fuzzing".

However, the Board's attention is directed to the remainder of the Background section of Fink, wherein it is disclosed:

> While the hot-melt compositions and processes heretofore known are considerably simpler than the latex process, the preparation of carpets of non-uniform quality has, at times, been encountered. Specifically, such carpets using hot-melt adhesives cannot, with reproducible consistency, be prepared with high scrim bonds (force required to remove the secondary backing from the finished carpet), high tuft pull strength (force required to pull one of the tufts out of the carpet), and high fuzz resistance (an indication of the individual carpet yarns to fuzz and form pills). (Col. 3, lines 51-61; emphasis added; also col. 4, lines 5-18).

Thus, while the passage quoted by the Examiner would seem to suggest that it is well-known in the art to modify hot-melt adhesive viscosity in order to achieve good resistance to tuft and fiber pull-out, it would seem that the passage quoted by the Examiner is instead merely part of a "wish list" expressed in cols. 2-3 of Fink. Fink's solution is to use an isotactic polypropylene adhesive, which is totally unrelated to the present invention. Withdrawal of the rejection is requested on this basis.

2. Claim 16 stands rejected under 35 U.S.C. §103(a) as obvious over WO '806, in view of either Scott et al., Reith, and optionally in view of Cross and further in view of Fink and Kasamatsu (U.S. Patent No. 4,708,629). Appellants traverse this basis for rejection and respectfully request reconsideration and withdrawal thereof.

Kasamatsu discloses a film-forming "T" die for low viscosity resin, especially for coating adhesive tapes (Abstract). The Examiner seems to suggest that the subject matter of claim 16 would have been obvious in view of Kasamatsu, in combination with the other cited references, in spite of the fact that Kasamatsu fails to disclose (1) coating of carpet backings, (2) the use of the claimed adhesives, (3) any

information as to suitable melt indices of the adhesives to be used therein, and (4) any information as to the distance between the die and the substrate to be coated.

Appellants respectfully submit that Kasamatsu fails to address the deficiencies of the other cited references, and as such is irrelevant to the present claims.

As such, none of the cited references, either alone or in combination, would make obvious the claims of the present application. Withdrawal of the rejection and allowance of the claims is requested.

Respectfully submitted,

THOMAS W. STEINBERG
ATTORNEY FOR APPELLANTS
Registration No.: 37,013
Telephone: (302) 892-0887
Facsimile: (302) 892-7343

Dated: 8/22/05

TWS:kl

8. CLAIMS APPENDIX

1. A process for preparation of a tufted polyamide-type fiber carpet comprising

providing a primary backing tufted with yarn comprised of at least 85% by weight of fibers selected from the group consisting of nylon fibers, wool fibers, and blends thereof, said tufted primary backing having a carpet side and an opposite back side,

providing a molten polymer adhesive having a melt index of at least 150 according to ASTM D-1238 @190°C with a weight of 2.16 Kg on the back side of the tufted primary backing, said polymer adhesive comprising at least 85% by weight of one or more ethylene copolymers or terpolymers each comprised of 50 to 95 weight % of ethylene, and 5-50 weight % of at least one carboxylic acid comonomer,

compressing said tufted primary backing and said molten polymer adhesive layer under a moving belt that applies a pressure of at least 1 N/cm^2 for a period of at least 5 seconds during which time the polymer adhesive remains in a molten state, and

cooling said molten polymer adhesive to a temperature below the melting point of said molten adhesive.

2. The process of claim 1 wherein prior to compressing said tufted primary backing and molten polymer adhesive under a moving belt, a secondary backing is placed over the molten polymer adhesive on the back of the primary backing.

3. The process of claim 1 further comprising the step of introducing the tufted primary backing with the molten polymer adhesive into a nip and compressing molten polymer adhesive into said tufted primary backing in said nip.

4. The process of claim 1 wherein compressing said tufted primary backing and said molten polymer adhesive layer under a moving belt comprises compressing tufted primary backing and said molten polymer adhesive layer between a moving belt and a rotating heated drum with an outer heated surface, wherein the heated drum has a diameter of from 1 to 3 meters, the outer heated surface of the

drum and the moving belt travel at substantially the same speed in the range of 10 to 30 m/minute, and the surface of the drum is heated to a temperature within the range of 130 to 180°C.

5. The process of claim 4 wherein the belt presses the primary backing against the heated drum with a pressure of from 2 to 10 N/cm^2.

6. (Withdrawn) The process of claim 2 wherein compressing said tufted primary backing, said molten polymer adhesive layer, and said secondary backing under a moving belt comprises the step of compressing tufted primary backing, said molten polymer adhesive layer and said secondary backing between two moving belts, wherein the moving belts are heated to a temperature within the range of 130 to 200°C over a distance of 3 to 10 meters, and wherein the two moving belts travel at substantially the same speed in the range of 10 to 30 m/minute.

7. (Withdrawn) The process of claim 6 wherein the two moving belts squeeze the primary backing, the molten polymer adhesive and the secondary backing together under a pressure of from 2 to 10 N/cm^2.

8. The process of claim 1 wherein the extrusion temperature of the molten polymer adhesive is in the range of 150 to 325°C.

9. The process of claim 2 further comprising the step of introducing a reinforcing grid between the back side of the tufted primary backing and the secondary backing prior to compressing said tufted primary backing, said molten polymer adhesive layer, and said secondary backing in said nip.

10. The process of claim 1 wherein the carboxylic acid comonomer is at least one of methacrylic acid and acrylic acid.

11. The process of claim 10 wherein the polymer adhesive is a terpolymer containing 50-90 weight % ethylene, 5-20 weight % butyl acrylate, and 5-20 weight % methacrylic acid.

12. The process of claim 10 wherein at least 20 weight % of the polymer adhesive is a copolymer containing 50-95 weight % ethylene and 5-50 weight % methacrylic acid.

13. The process of claim 12 wherein at least 20 weight % of the polymer adhesive is a copolymer containing 50-95 weight % ethylene and 5-50 weight % vinyl acetate.

14. (Canceled).

15. The process of claim 1 wherein the polymer adhesive has a melt index in the range of 200 to 800 according to ASTM D-1238 @190°C with a weight of 2.16 Kg.

16. The process of claim 1, wherein said molten polymer adhesive is melt extruded onto the back side of said tufted primary backing through an extrusion die positioned less than 5 cm from said tufted primary backing.

17. (Withdrawn) The process of claim 1, wherein said molten polymer adhesive is provided in the form of a fine powder and melted by a radiant heater.

18. The process of claim 1, wherein said tufted primary backing and said molten polymer adhesive layer are compressed for a period between about 5 and 15 seconds.

9. EVIDENCE APPENDIX

Declaration under 37 CFR 1.132 of Raymond Reisdorf.